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(54) **Outdoor unit of air conditioner**

(57) Provided is an outdoor unit (10) of an air conditioner. The outdoor unit (10) includes a heat exchanger (25) where outdoor air is heat-exchanged with refrigerant, and a base pan (56) disposed below the heat exchanger (25), wherein the base pan (56) is provided with a condensed water drain hole (568) through which con-

densed water generated on a surface of the heat exchanger (25) is drained, and a bottom surface of the base pan (56) is inclined downward toward the condensed water drain hole (568).

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## Description

### BACKGROUND

[0001] Embodiments relate to an outdoor unit of an air conditioner.

[0002] In general, an air conditioner is an apparatus heating and cooling indoor space by performing a refrigerant cycle including compression-condensation-expansion-evaporation.

[0003] Such an air conditioner includes an indoor unit where refrigerant is heat-exchanged with indoor air, and an outdoor unit where the refrigerant is heat-exchanged with outdoor air. The indoor unit includes an indoor heat exchanger for heat-exchanging the indoor air with the refrigerant, a fan blowing the indoor air, and a motor rotating the fan. The outdoor unit includes an outdoor heat exchanger for heat-exchanging the refrigerant with the outdoor air, a fan for blowing the outdoor air, a motor for rotating the fan, a compressor compressing the refrigerant, an expansion part expanding the refrigerant, and a four-way valve changing a flow direction of the refrigerant.

[0004] When an indoor cooling operation is performed, the indoor heat exchanger serves as an evaporator, and the outdoor heat exchanger serves as a condenser. The four-way valve changing the flow direction of the refrigerant switches the heating and cooling operations to each other.

### SUMMARY

[0005] Embodiments aim to provide an air conditioner configured to improve the drain of condensed water generated at a heat exchanger.

[0006] In a preferred embodiment, an outdoor unit of an air conditioner comprises a heat exchanger where outdoor air is heat-exchanged with refrigerant, and a base pan disposed below the heat exchanger, wherein the base pan is provided with a condensed water drain hole through which condensed water generated on a surface of the heat exchanger is drained, and a bottom surface of the base pan is inclined downward toward the condensed water drain hole.

[0007] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features will be apparent from the description and drawings, and from the claims.

### BRIEF DESCRIPTION OF THE DRAWINGS

#### [0008]

FIG. 1 is a perspective view illustrating an outdoor unit of an air conditioner according to an embodiment.

FIG. 2 is an exploded perspective view illustrating an outdoor unit of an air conditioner according to an

embodiment.

FIG. 3 is a perspective view illustrating a base pan in an outdoor unit of an air conditioner according to an embodiment.

FIG. 4 is a cross-sectional view taken along line A-A' of FIG. 3.

FIG. 5 is a cross-sectional view taken along line B-B' of FIG. 3.

### DETAILED DESCRIPTION OF THE EMBODIMENTS

[0009] Reference will now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings.

[0010] In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration specific preferred embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is understood that other embodiments may be utilized and that logical structural, mechanical, electrical, and chemical changes may be made without departing from the scope of the invention. To avoid detail not necessary to enable those skilled in the art to practice the invention, the description may omit certain information known to those skilled in the art. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

[0011] FIG. 1 is a perspective view illustrating an outdoor unit of an air conditioner according to an embodiment, and FIG. 2 is an exploded perspective view illustrating an outdoor unit of an air conditioner according to an embodiment.

[0012] Referring to FIGS. 1 and 2, an outdoor unit 10 of an air conditioner according to an embodiment includes various devices for a refrigerant flow, a fan motor assembly for blowing air, a partition 40 for partitioning inner space of the outdoor unit 10, a control box 60 for controlling the various devices and the fan motor assembly, and an outer case 50 defining an outer appearance.

[0013] In detail, the various devices for the refrigerant flow includes a compressor 21 for compressing the refrigerant, a four-way valve 22 for changing a flow direction of the refrigerant, an expansion part 23 in which the refrigerant is expanded, a heat exchanger 25 for heat-exchange between the refrigerant and outdoor air, an accumulator 26 for separating a gaseous refrigerant from a liquid refrigerant, a refrigerant pipe 27 connecting the above-described devices to each other such that the refrigerant flows, an indoor unit for heat-exchange between the refrigerant and indoor air, and a connection pipe 28 connecting the indoor unit to the refrigerant pipe 27.

[0014] The fan motor assembly includes a fan 31 generating an air-pressure difference due to rotation, a motor 33 providing a driving force for rotating the fan 31, and a

motor-fixing part 35 for fixing the motor 33.

**[0015]** The partition 40 is provided between the fan motor assembly and the various devices for the refrigerant flow except the heat exchanger 25. That is, the inner space of the outdoor unit 10 is partitioned into a blowing region in which the fan motor assembly is installed and a device region in which the various devices for the refrigerant flow except the heat exchanger 25 are installed.

**[0016]** The control box 60 is seated on an upper end of the partition 40. A control panel 62 for fixing various electric wires connected to the control box 60 is coupled to a side of the control box 60.

**[0017]** The outer case 50 includes a front surface case 51 defining an outer appearance of a front surface, a pipe-side case 53 shielding the refrigerant pipe 27, a heat exchanger-side case 54 shielding a lateral surface of the heat exchanger 25, a top surface case 55 shielding a top surface, and a base pan 56 supporting the various devices for the refrigerant flow and the fan motor assembly.

**[0018]** In detail, an exhaust grill 52 exhausting air heat-exchanged through the heat exchanger 25 is provided in the front surface case 51. The exhaust grill 52 has a circular shape having a size equal to or greater than that of the fan 31 when viewed from the front side. In addition, the exhaust grill 53 is provided with a plurality of exhaust holes having a net shape.

**[0019]** A pipe fixing part 57 for fixing the refrigerant pipe 27 and the connection pipe 28 is coupled to the pipe-side case 53. A pipe cover 58 for shielding the pipe-fixing part 57 and the connection pipe 28 is coupled to an outer surface of the pipe-side case 53.

**[0020]** A plurality of intake holes for sucking the outdoor air toward the heat exchanger 25 are defined in the heat exchanger-side case 54. A back surface intake grill 59 for sucking the outdoor air is provided in a rear direction of the heat exchanger 25, i.e., a back surface of the outer case 50. A fixing support 70 for fixing and supporting the base pan 56 is provided under the base pan 56.

**[0021]** Hereinafter, a base pan in an outdoor unit of an air conditioner according to an embodiment will now be described in detail.

**[0022]** FIG. 3 is a perspective view illustrating a base pan in an outdoor unit of an air conditioner according to an embodiment. FIG. 4 is a cross-sectional view taken along line A-A' of FIG. 3. FIG. 5 is a cross-sectional view taken along line B-B' of FIG. 3.

**[0023]** Referring to FIGS. 3 to 5, the base pan 56 includes a compressor seat 561 on which the compressor 21 is seated, a compressor fixing part 562 fixing the compressor 21, a motor fixing seat 563 on which the motor fixing part 35 is seated, a heat exchanger seat 567 on which the heat exchanger 25 is seated, and a condensed water drain hole 568 for draining condensed water generated at the heat exchanger 25.

**[0024]** The compressor seat 561 protrudes from a top surface of the base pan 56. The compressor fixing part 562 is provided to the compressor seat 561, and received and coupled to a coupling hole (not shown) of the com-

pressor 21 to fix the compressor 21 to the base pan 56.

**[0025]** The motor fixing seat 563 also protrudes from the top surface of the base pan 56. A coupling part 564 for coupling to the motor fixing part 35 and a guide part 565 for guiding the motor fixing part 35 to be seated in position are provided on the motor fixing seat 563. A portion of the top surface of the base pan 56 is cut, and then bent upward to form the coupling part 564 and the guide part 565. The guide part 565 has a width that narrows toward an end portion thereof and is long in a back and forth direction. A coupling hole 566 through which a coupling unit (not shown) for coupling the motor fixing part 35 to the base pan 56 passes is defined in the coupling part 564.

**[0026]** The heat exchanger seat 567 also protrudes from the top surface of the base pan 56. The heat exchanger seat 567 is provided in plurality over a side end and a rear end in the top surface of the base pan 56. The heat exchanger seat 567 contacts a bottom surface end of the heat exchanger 25 when the heat exchanger 25 is seated on the heat exchanger seat 567. Thus, a heater 569 is disposed vertically below the heat exchanger 25.

**[0027]** The condensed water drain hole 568 is disposed in the rear end of the base pan 56, i.e., in the lower side of the heat exchanger 25 between the heat exchanger seats 567. The top surface of the base pan 56 except for protrusion parts including the compressor seat 561, the motor fixing seat 563, and the heat exchanger seats 567 is inclined downward toward the condensed water drain hole 568. That is, in the case where the base pan 56 is fixed by the fixing support 70, the condensed water drain hole 568 is disposed at the lowest position in the top surface of the base pan 56. Also, the top surface of the base pan 56 except for the protrusion parts may function as a drain passage for flowing the condensed water to the condensed water drain hole 568.

**[0028]** In addition, the base pan 56 is provided with a plurality of reinforcements 560 except for the compressor seat 561, the motor fixing seat 563, and the heat exchanger seats 567. The reinforcements 560 guide a flow direction of the condensed water simultaneously with reinforcing the base pan 56.

**[0029]** The condensed water is drained more effectively by the base pan 56. Particularly, when the condensed water generated at the heat exchanger 25 or the refrigerant pipe 27 is collected on the top surface of the base pan 56, the condensed water is moved by its own weight along the drain passage to the condensed water drain hole 568, so as to improve the drain of the condensed water.

**[0030]** Since the compressor 21 and the heat exchanger 25 are spaced apart from the top surface of the base pan 56 by the compressor seat 561 and the heat exchanger seats 567, the condensed water generated at the heat exchanger 25 or the refrigerant pipe 27 and collected into the top surface of the base pan 56 is prevented from being in contact with the compressor 21 and the heat exchanger 25. Thus, the corrosion of the compres-

sor 21 and the heat exchanger 25 due to the condensed water is prevented and the performance of the heat exchanger 25 is improved.

**[0031]** Also, even when the temperature of the outdoor air drops below zero degrees Celsius, and the condensed water is frozen on the surface of the heat exchanger 25, the frozen condensed water is thawed and removed by the operation of the heater 569. Particularly, since the heater 569 is disposed vertically below the heat exchanger 25, air heated by the heater 569 naturally moves upward to heat the entire heat exchanger 25. This makes it possible to improve the efficiency of a defrosting operation.

**[0032]** Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the scope of the invention as defined by the claims. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

6. An air conditioner comprising the outdoor unit according to any preceding claim.

## Claims

1. An outdoor unit of an air conditioner, comprising a heat exchanger where outdoor air is heat-exchanged with refrigerant, and a base pan disposed below the heat exchanger, wherein the base pan is provided with a condensed water drain hole through which condensed water generated on a surface of the heat exchanger is drained, and a bottom surface of the base pan is inclined downward toward the condensed water drain hole.
2. The outdoor unit according to claim 1, wherein the bottom surface of the base pan is provided with a protruding seat on which the heat exchanger is seated.
3. The outdoor unit according to claim 1 or 2, wherein a heater is interposed between a lower end of the heat exchanger and the base pan.
4. The outdoor unit according to claim 3, wherein the heater is seated on a top surface of the base pan.
5. The outdoor unit according to any preceding claim, wherein the top surface of the base pan is provided with a protruding seat on which a compressor is seated.

FIG.1

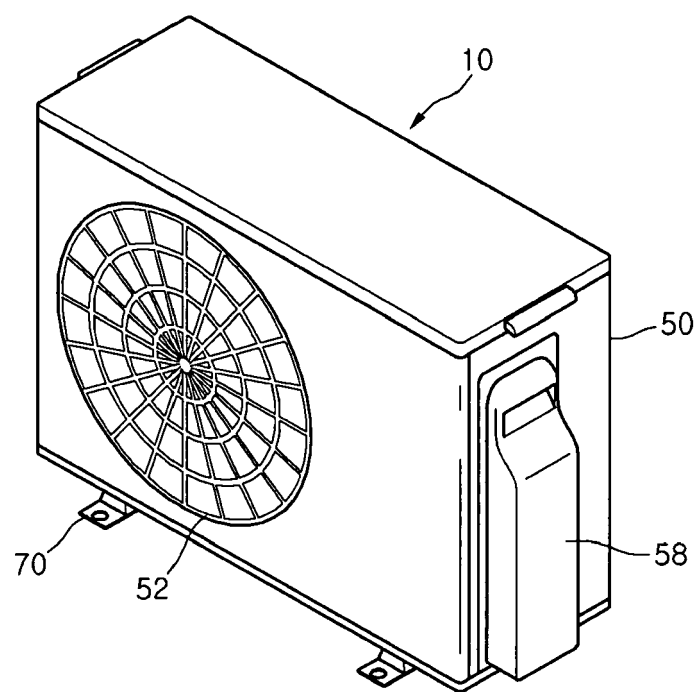


FIG.2

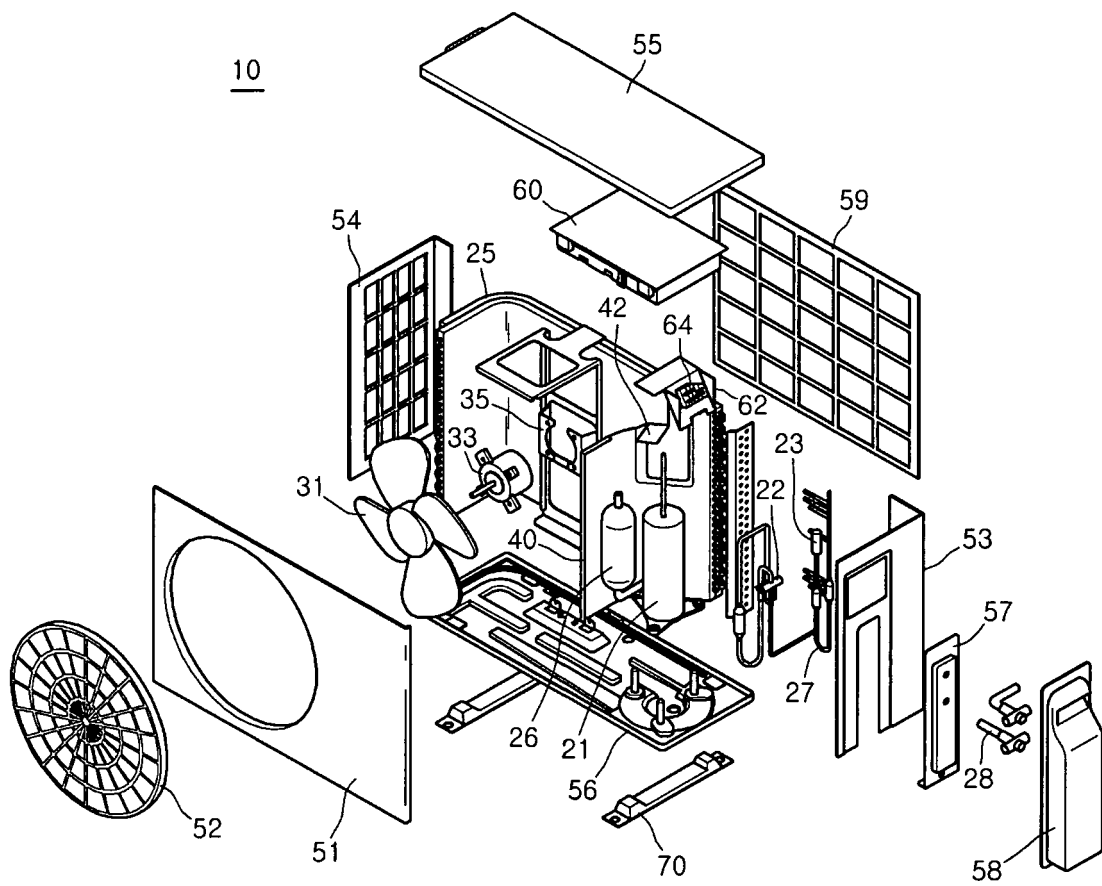


FIG.3

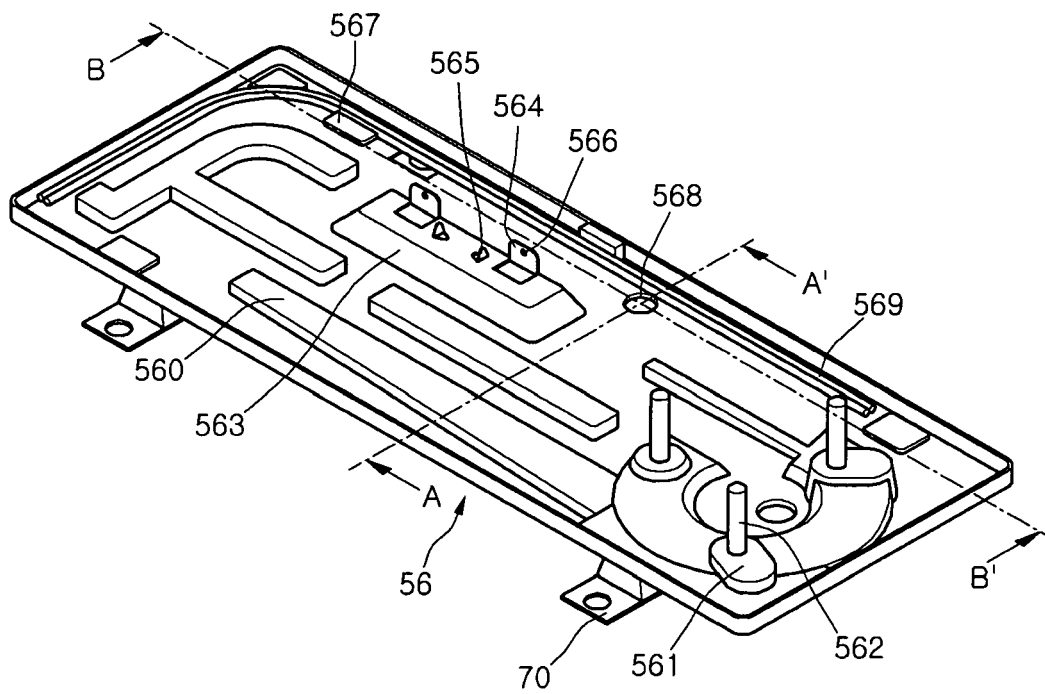


FIG.4

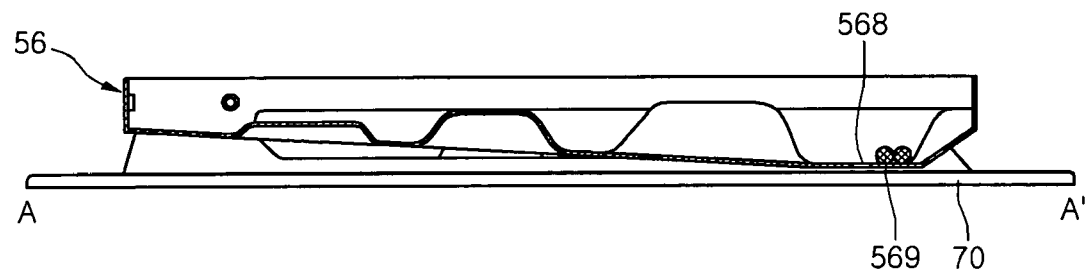




FIG.5

